

What is claimed is:

- 1) A semi-crystalline, largely isotropic, porous coal-based product produced from particulate coal of a small diameter, having a density of between about 0.1 and about 0.8 g/cm^3 and a thermal conductivity below about $1 \text{ W/m}^\circ\text{K}$.
- 2) The porous coal-based product of claim 1 having a compressive strength below about 6000 psi.
- 3) The porous coal-based product of claim 1 that has been carbonized.
- 4) The porous coal-based product of claim 1 that has been graphitized.
- 5) A method for producing a porous coal-based product from coal comprising:
- A) comminuting coal to a small particle size to form a ground coal;
 - B) placing said ground coal in a mold;
 - C) heating said ground coal in said mold under a non-oxidizing atmosphere to a temperature of between about 300°C and about 700°C and soaking at this temperature for a period of from about 10 minutes to about 12 hours to form a preform; and

D) controllably cooling said preform.

6) The method of claim 5 wherein said inert atmosphere is applied at a pressure of from about 0 psi up to about ^{500 psi} ~~500 psi~~.

7) The method of claim 5 wherein said temperature is achieved using a heat-up rate of between about ^{1°C to about 20°C} ~~1°C~~ to about 20°C per minute.

8) The method of claim 5 wherein said controlled ^{cooling} is accomplished at a rate of less than about ^{10°C/min to a temperature of about 100°C} ~~10°C/min to a temperature of about 100°C~~.

9) The laminated sheet product of claim ¹² ~~8~~ wherein said material is selected from the group consisting of aluminum, steel, polymer sheet, ^{no} inconel, ^{no} titanium, ^{no} refractory metals, fiber reinforced polymer sheet and paper.

10) The laminated sheet product of claim ¹² ~~8~~ wherein said sheet core has been carbonized.

11) The laminated sheet product of claim ¹² ~~8~~ wherein said sheet core is graphitized.